

Capturing Accurate and Useful Information on Medication-Related Telenursing Triage Calls

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Abstract. Registered nurses providing telenursing triage and advice services record information on the medication related calls they handle. However the quality and consistency of these data were rarely examined. Our aim was to examine medication related calls made to the healthdirect advice service in November 2014, to assess their basic characteristics and how the data entry format influenced information collected and data consistency. Registered nurses selected the patient question type from a range of categories, and entered the medications involved in a free text field. Medication names were manually extracted from the free text fields. We also compared the selected patient question type with the free text description of the call, in order to gauge data consistency. Results showed that nurses provided patients with advice on medication-related queries in a timely matter (the median call duration of 9 minutes). From 1835 calls, we were able to identify and classify 2156 medications into 384 generic names. However, in 204 cases (11.2% of calls) no medication name was entered. A further 308 (15.0%) of the medication names entered were not identifiable. When we compared the selected patient question with the free text description of calls, we found that these were consistent in 63.27% of cases. Telenursing and triage advice services provide a valuable resource to the public with quick and easily accessible advice. To support nurses provide quality services and record accurate information about the queries, appropriate data entry format and design would be beneficial.

Keywords. Medication, advice, telenursing, telehealth, data entry, data quality and consistency

Introduction

As demands on healthcare systems increase, telenursing triage and advice services have increased in use, with the aim of expanding access to healthcare and reducing demand on GPs and emergency departments[1]. Several countries, including Australia, Denmark, New Zealand, Sweden, Canada, the USA and the UK, are now using this model of healthcare provision, alongside traditional modes of delivery.[2] Telenursing triage and advice services allow members of the public to phone a nurse, describe symptoms or a health issue and receive healthcare advice. Nurses handling such calls

are aided by software providing data entry about the calls and decision support functionalities. The use of this software aims to provide a standardised approach to overcome the difficulties telenurses encounter, due to the inability to see the patient, with a structured system of questions and guidelines.[3]

Investigations into these services have revealed that telenurses express a mixture of opinions about the software they use while handling calls. One study reported that nurses felt supported by the software, that it simplified their work, provided complementary support and professional security, as well as enhancing their credibility. Telenurses also believed that the decision support tools aided quality improvement by providing uniform and faster advice to callers.[4] However, evidence also exists which shows that nurses feel the software can be incomplete or inadequate, that it can be useful for assessment but presents limitations around decision making, that the software is not intuitively designed, and can inhibit effective communication with callers.[4, 5] A usability study of call management software (a hybrid EMR and a decision support software tool) identified 100 usability errors or problems and four unnecessary steps within the software. As a result of this evaluation the software was modified, which reduced the average time it took nurses to handle calls.[6]

Healthdirect Australia provides a free helpline service (the healthdirect helpline), staffed by registered nurses, operating 24 hours, seven days a week. In order to most effectively provide care to callers, nurses use specialised software for standardised decision support and data entry. This software provides guidelines and protocols, access to decision support tools, and fields for electronic documentation of call characteristics. A significant part of the software is also dedicated to medication related calls, with its own path of guidelines and protocols and medication information resources. Medication related calls form the largest individual category of call queries to the healthdirect service yet there is limited research on these types of calls, or the software used and the data quality aspects of these calls. Our aim was to examine medication related calls made to the healthdirect advice service in November 2014, to assess their basic characteristics and how the data entry format influenced information collected and data consistency.

1. Methods

1.1. Study Design and Data Source

This was a retrospective cohort study which examined medication-related calls received by the healthdirect helpline in Australia in November 2014. Nurse call-takers provide callers with information and advice, but are not able to provide diagnosis of callers' problems. The service is available to 54.9% of Australia's total population and is funded by the Australian government.

During the calls, the nurses used specialised software to move through and select appropriate guidelines and receive decision support advice. They also record information about the call, including caller and patient demographics, query type, symptoms, the advice given and the medications involved. The nurses select the query type from a list of broad categories (Figure 1) and record information about the number and type of medications involved in the call in a free text field (Figure 2). Other categories of data entry are similarly free text or selected from a range of options.

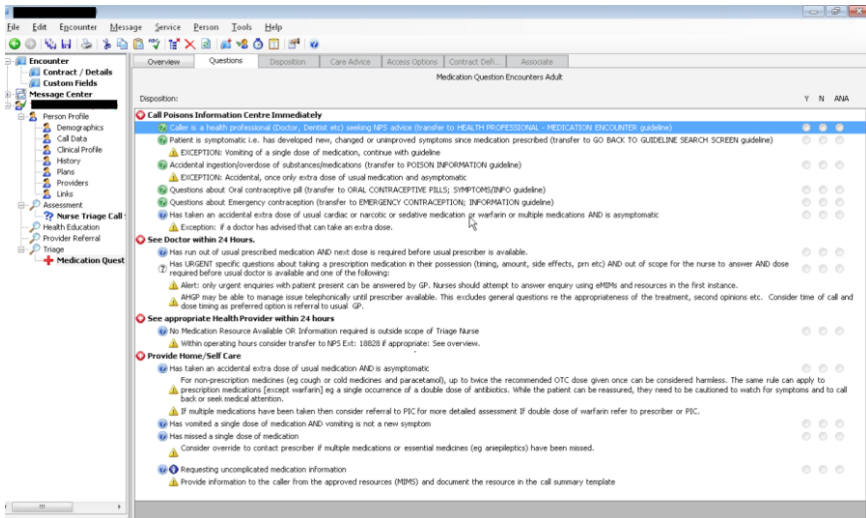


Figure 1. A screenshot of the software used by registered nurses at healthdirect, showing the disposition of the call

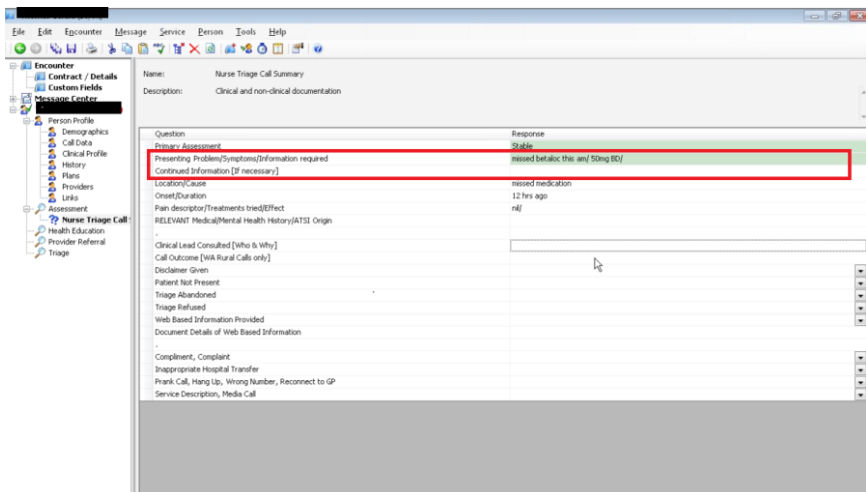


Figure 2. A screenshot of the software used by nurse call-takers at healthdirect, showing the free text field for data entry.

1.2. Data Extraction and Analysis

We obtained de-identified call data from healthdirect for the one month period and extracted data relating to medication queries. The presenting problem as described by a caller was documented by registered nurse in a free text field, from which we identified medications involved and then coded medication names into their generic names and therapeutic classes based on the MIMS Australia database. We also assessed the number and type of medications involved in calls and some basic call characteristics.

We selected MIMS as our reference as it is an independent and highly trusted source of drug information, utilised by healthcare professionals in Australia, New Zealand and Asia.

We also conducted a data consistency check between the presenting problems recorded in the free text fields and the patient questions which were selected by nurses from a list of structured categories.

2. Results

Medication query calls was the largest category of calls in the November data, constituting 3.8% (n= 1835) of calls. We were able to identify and classify 2156 medications into 384 generic names. However, in 204 cases (11.2% of calls) no medication name was entered. A further 308 (15.0%) of the medication names entered were not identifiable, even following review by a pharmacist. Table 1 depicts the results of our attempt to identify medications from the free text field.

Table 1. Identification of Medication Names

Type	Percent of Calls	Number of calls
No medication name entered in free text field	11.2%	204
Medication name entered was not identifiable	15.0%	308
Medication(s) identified from free text	73.8%	1323

2.1. Number of Medications Per Call and Duration of Calls

There was no specific mention in the call data of the number of medication involved, however we calculated this when we had extracted the medication names. Over half of all medication related calls (55.3%, n= 1015) involved only one medication, 24.9% of calls involved two medications (n= 456) and the remaining 8.7% (n= 158) of calls mentioned between three and twelve different medications.

Overall, the median duration of medication calls was 9 minutes. The duration of calls was similar regardless of the number of medications.

2.2. Medications Involved

The medications most frequently enquired about were paracetamol (8.2%, n= 207), ibuprofen (4.4%, n= 112) and paracetamol with codeine (2.3%, n= 59).

Next we classified these medications into their respective therapeutic classes and found that the most frequent classes were simple analgesics and antipyretics (9.1% of medications, n= 230), non-steroidal anti-inflammatory agents (6.7%, n= 170) and antidepressants (6.2%, n= 157).

2.3. Patient Questions

Registered nurses were required to categorise each patient's questions, from a list of thirteen categories. The five most frequent patient query categories were 'requesting uncomplicated medication information' (n= 770, 42.0%), 'no medication resource available OR information required is beyond the scope of triage nurse' (n= 602, 32.8%), 'has missed a single dose of medication (n= 139, 7.6%), 'has taken an accidental extra dose of usual medication AND is asymptomatic' (n= 68, 3.7%), and 'patient does not consent to transfer to telephone GP or GPAT or call is outside GP After Hours Service operating hours and is therefore ineligible for transfer' (n= 64, 3.5%).

2.4. Data Consistency

When we compared the selected patient questions with the patient presenting problems in the free text field we found that in 63.3% (n= 1161) of cases the patient question selected appeared to be appropriate, based on what had been entered into the free text field. In 19 calls (1.0%) there was not enough information entered to make an assessment. For 655 calls (35.7%) we determined that the patient question selected was inconsistent with the free text information, and 91.0% (n= 596) of these were originally categorised as 'No medication resource available OR information required is outside the scope of Triage nurse.' We assessed and re-categorised these calls based on the free-text entry and 72.8% of them (n=473) were classified as 'Requesting uncomplicated medication information.'

Table 2. Consistency between patient presenting problem entered in the free text field and patient problem selected from the list of patient questions

Query Category Assessment	Percent of calls	Number of calls
Query category assessed as consistent	63.3%	1161
Query category assessed as inconsistent	35.7%	655
Not enough information to assess	1.0%	19

3. Discussion and Conclusion

This study showed that nurses provided patients with advice on medication-related queries in a timely matter (the median call duration of 9 minutes). When there are time constraints upon data entry, or fields which require clear statements which may vary substantially, free text fields are optimal. However, we identified a number of data quality issues related to free text data entry in this study, such as missing data, spelling and grammatical errors. The difficulty we encountered with extracting and categorising the medications involved in the calls prompted healthdirect to adopt a structured data entry practice for medications. Nurse call now select relevant medications from a drop down list. It is anticipated that this will vastly improve the ease with which medications can be extracted from the data and classified.

The way in which data about calls to these telenursing services is collected will influence insights which can be gained, and potentially also wider research questions. There is a value in having software formatted in such a way as to facilitate the collection of good quality, usable and consistent data.

It is difficult to isolate a direct cause of the inconsistency between the selected patient question categories and the data entered in the free text field. We hypothesise that in some cases the selected question category may be correct but the nurse did not enter enough information into the free text field, possibly due to a lack of time. In other cases the question may not have fitted neatly in to a particular category, and the registered nurse may have simply selected a category they felt was closest, or possibly at random, as there was no 'other' option. We suggest that it may be worth considering expanding upon the list of question categories to better encapsulate question types, as well as creating mandatory fields.

It is of course necessary to balance the needs of the nurses, the provision of quality care to the caller, and the collection of relevant and useful data about the calls. Overwhelming nurses with too many options or too many fields to complete may detract from call quality, while unsuitable data entry will limit the use of the collected data.

Despite the problems we encountered with data quality we were able to determine that the two medications about which callers made the most queries – paracetamol and ibuprofen – were both 'over the counter' medications. The reason for the high number of inquiries about these medications may be due to their easy availability without prescription, and/or due to their high frequency of use among the population. The Australian Bureau of Statistics found that the most commonly used over the counter medications in Australia were pain relievers, being used by 20% of the population.[7]

Telenursing and triage advice services provide a valuable resource to the public with quick and easily accessible advice. The data from these calls can provide useful insights into the public's health information needs and wants. However in order for these insights to be gleaned it is imperative that the data collection tools used are regularly reviewed. To support nurses providing quality services and recording accurate information about the queries, appropriate data entry format and design would be beneficial.

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Preface

There's never been a more exciting time to be involved with health informatics. In the last few decades, health informaticians have established the knowledge base and practical expertise to facilitate the development of ever-more capable technical systems, increasing connectivity, expanding access and greater mobility of e-health and information management systems. We have seen the evolution from simple computer based records to systems that allow intra-organisational, national, even international communication and information exchange. We have also seen progress in e-health and most recently m-health, facilitating access to information and advice almost anytime, anywhere. The health informatics community is now building on this strong foundation, taking a central role in the digital transformation of the healthcare sector. The Australian National Health Informatics Conference (HIC), Australia's premier health informatics event, is a key avenue for facilitating this transformation. This Conference, organised by the Health Informatics Society of Australia (HISA), with the support of the Australasian College of Health Informatics (ACHI), provides the ideal professional and social environment for clinicians, researchers, health IT professionals, industry and consumers to integrate, educate and share their knowledge to drive innovative thinking, to enhance services and allow greater consumer involvement. This is emphasised in the primary theme of the 2016 Conference: Digital Health Innovation for Consumers, Clinicians, Connectivity, Community.

The papers in this volume reflect this theme, highlighting the cutting edge research evidence, technology updates and innovations that are seeing the digital transformation of the healthcare sector. The papers are indicative of the wide spectrum of work encompassing major theoretical concepts, examples of key applications of new technologies and important new developments in the field of health informatics. They emphasise the central role that health informatics and e-health play in connecting information systems, being smart with data, and enhancing both practitioner and consumer experience in healthcare interactions. Welcome to the innovation boom.

This year's program maintains the high standard of papers for which the conference is well-known. All papers were blind-peer reviewed by three experts in the field of health informatics. These reviewers are widely considered to be prominent academics and industry specialists. The contribution of the Australasian College of Health Informatics, particularly the voluntary participation of Fellows, in supporting this review process is gratefully acknowledged. Similar contributions made by many senior and experienced members of the Health Informatics Society of Australia is also acknowledged. Forty papers underwent the initial review and feedback process. Resubmitted papers were then validated by the Scientific Program Committee to ensure that reviewers' recommendations were appropriately addressed or rebutted. In total 20 papers were selected for inclusion in this volume. Congratulations to all the authors.

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